

# FEATHER RIVER DIVERTERS

## JOINT WATER DISTRICTS

735 Virginia Street  
Gridley, California 95948  
Telephone: (530) 846-3307

## WESTERN CANAL WATER DISTRICT

P.O. Box 190  
Richvale, California 95974  
Telephone: (530) 342-5083

### Representing:

Richvale Irrigation District  
Biggs-West Gridley Water District  
Butte Water District  
Sutter Extension Water District

March 21, 2000

Director Thomas M. Hannigan  
State of California  
Department of Water Resources  
1416 Ninth Street  
P.O. Box 942836  
Sacramento, CA 94236-0001

Re: DWR Obligations to Deliver Water from Thermalito Afterbay at  
Temperatures Suitable for Agriculture

Dear Director Hannigan:

We wrote you a letter dated February 1, 2000 regarding the above DWR obligation to deliver water from Thermalito Afterbay at temperatures suitable for agriculture. We have not as yet had your response and the year 2000 irrigation season is fast approaching.

During the interim period of time between February 1 and the date of this letter, and during our ongoing preparation for what we presume will be the commencement of Phase 8 of the Bay-Delta Hearings sometime later this year, we discovered the enclosed 14-page brochure produced by DWR entitled "Temperature Control of Water From Oroville Reservoir." The brochure was apparently developed and released during Governor Edmund G. "Pat" Brown's term as Governor of California and your predecessor, Bill Warnes's term as DWR Director. Both men presided during the building of Oroville Dam and reservoir in the early 60's.

A reading of the enclosed brochure produced at the time of building Oroville Dam and reservoir fairly supports the reasoning we submitted to you in our letter of February 1. For example, page 5 states:

"The California Department of Water Resources has studied the potentially detrimental effects of cold water releases from the depths of Oroville reservoir upon local crops, fisheries, and recreation.

EXHIBIT "B" PG. 1 OF 17

To: Director Thomas M. Hannigan  
State of California, Dept. of Water Resources  
Re: DWR Obligations to Deliver Water from Thermalito Afterbay  
at Temperatures Suitable for Agriculture  
Date: March 21, 2000

Page 2

Concluding that a means must be found to control the temperature of releases from Oroville reservoir so as to meet the diverse needs of a cold-water and a warmwater fishery, of rice growers, and of swimmers, snorklers, and water skiers, the Department set about to find that means.

This booklet describes the problems involved and reports on the solution discovered." See Page 5 of "Temperature Control of Water From Oroville Reservoir" produced by the Department of Water Resources in the early 60's.

With respect to the impacts of "cold water" on the Feather River Fishery, the enclosed report states:

"In the past, rivers and streams near Oroville have been considerably warmer. They have averaged from 52°F on May 1 to 72°F in August. The existing fishery has flourished in these warmer waters. The Department of Water Resources intends to see that cold water releases from Oroville reservoir do not harm that fishery." See Page 7 of "Temperature Control of Water From Oroville Reservoir" produced by the Department of Water Resources.

With respect to the subject of fish, the enclosed states:

"The Feather River abounds in warmwater gamefish: striped bass, largemouth and smallmouth bass, shad, and catfish. During their growing season -- April through October -- these fish thrive best in waters averaging 60° to 75°F." See Page 9 of "Temperature Control of Water From Oroville Reservoir" produced by the Department of Water Resources in the early 60's.

With regard to agricultural production of rice by a number of landowners within our Districts, the enclosed report states in part:

"The fields of the Feather River Service Area will be irrigated by releases from Oroville reservoir. Rice production is important to the economy here; and irrigation water temperature is a critical factor in rice growth.

Cold water released from the depths of Oroville reservoir would harm the rice crop. Even without Oroville Dam, water temperatures of the Feather River are not ideal for rice growth. Their average May through August range has been from 52° to 72°F.

EXHIBIT "B" PG 2 OF 17

To: Director Thomas M. Hannigan  
State of California, Dept. of Water Resources  
Re: DWR Obligations to Deliver Water from Thermalito Afterbay  
at Temperatures Suitable for Agriculture  
Date: March 21, 2000

Page 3

The University of California has demonstrated that rice plants thrive best when the temperature of irrigating waters ranges from 59° to 77°F. Even within this critical range, temperature fluctuation drastically affects the harvest.

With a proper outlet structure at Oroville Dam, the temperature of releases can be controlled so as to serve the agricultural interests of the area." See Page 11 and Page 12 of "Temperature Control of Water From Oroville Reservoir" produced by the Department of Water Resources in the early 60's.

Again, Director Hannigan, we urge you to deliver a written communication to the authors of the memos sent you which we identify in our letter to you of February 1, 2000. Please advise NOAA/NMFS, USBR, USFWS and DFG to assist DWR in ensuring that water temperatures delivered to both the Joint Water District Members and WCWD Service Areas are delivered and distributed in reasonable compliance with the water temperature level set forth not only in our letter to you of February 1 but also in your own enclosed document entitled "Temperature Control of Water From Oroville Reservoir." We understand the press of business at DWR but we would appreciate a response within the next ten (10) business days so that we may know of DWR's position on this critically important subject in accord with our 1969 and 1985 Agreements and prior to the start of the year 2000 irrigation season.

Very truly yours,

**FEATHER RIVER DIVERTERS**

**JOINT WATER DISTRICTS**

**Richvale Irrigation District**

By: Gene Harris  
Gene Harris - President

**Sutter Extension Water District**

By: Ronald Harrington  
Ronald Harrington - Chairman

**Biggs-West Gridley Water District**

By: Ralph R. Cassady  
Ralph R. Cassady - President

**WESTERN CANAL WATER DIST.**

By: Lance Tennis  
Lance Tennis - President

**Butte Water District**

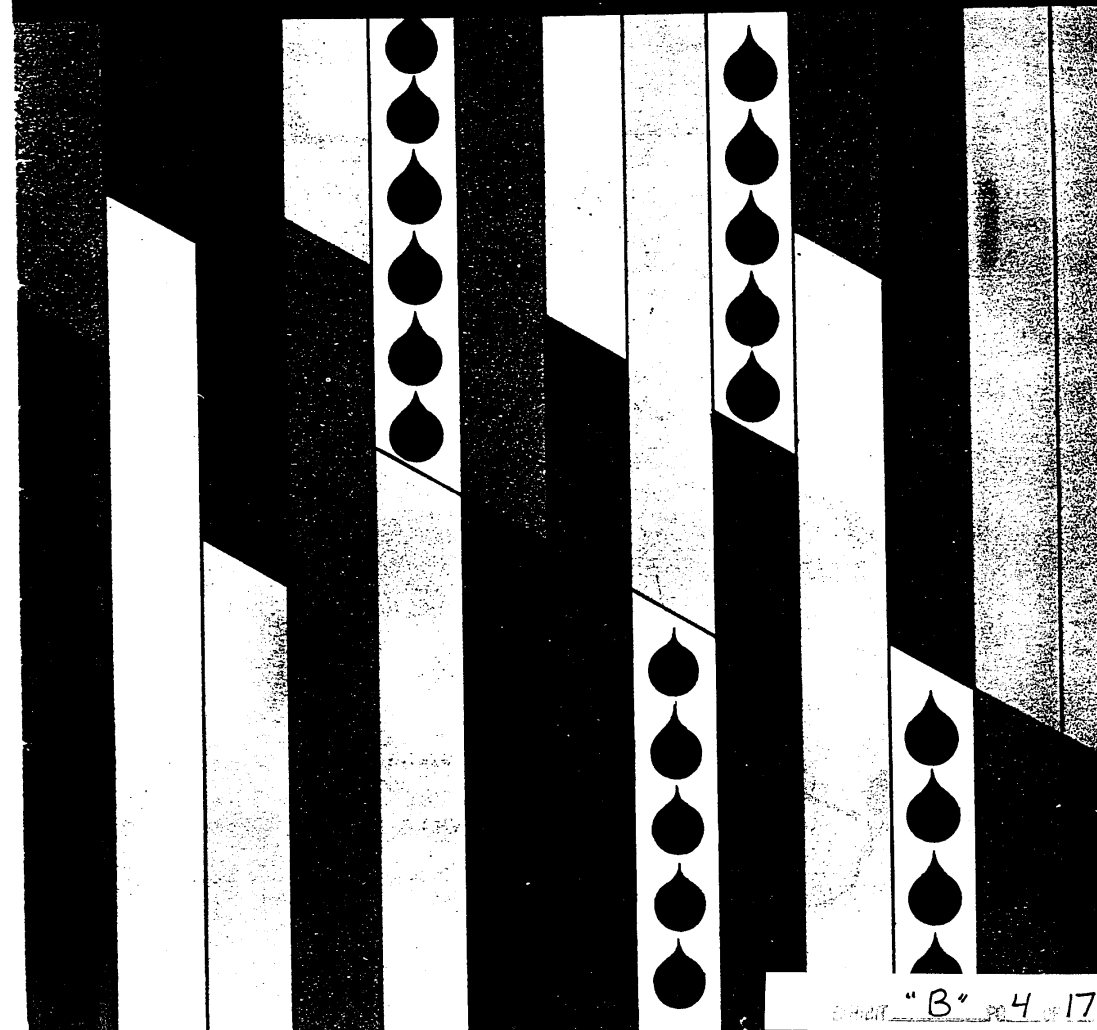
By: Robert C. Waller  
Robert Waller - President

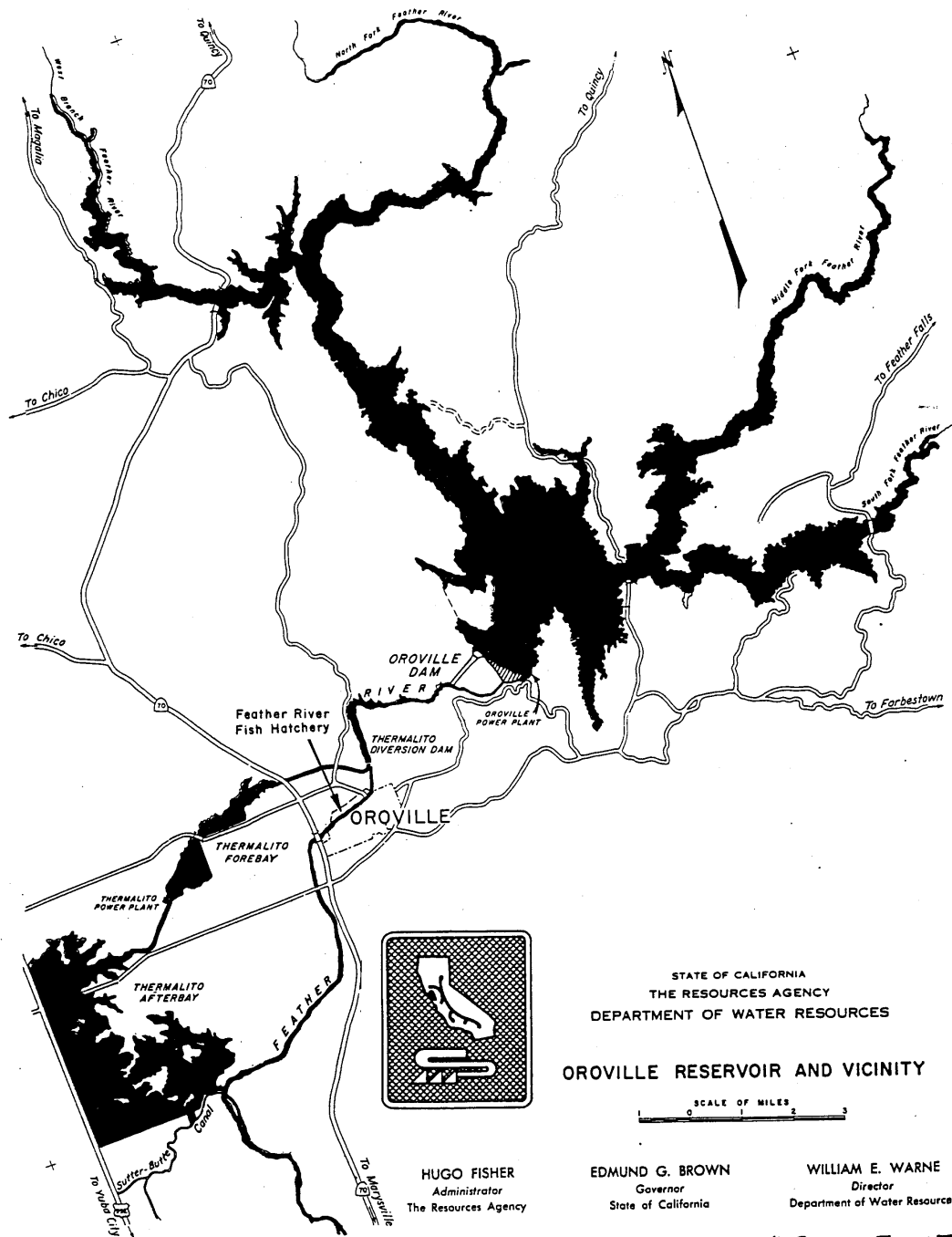
Enclosure

cc: National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
California Department of Fish and Game  
United States Fish and Wildlife Service

EXHIBIT "B" PG 3 OF 17

TEMPERATURE CONTROL OF WATER FROM OROVILLE RESERVOIR





STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES

# OROVILLE RESERVOIR AND VICINITY

SCALE OF MILES  
0 1 2 3

HUGO FISHER  
Administrator  
The Resources Agency

EDMUND G. BROWN  
Governor  
State of California

WILLIAM E. WARNE  
Director  
Department of Water Resources

EXHIBIT "B" PG 5 OF 17

THE  
WATER  
TEMPERATURE  
PROBLEM

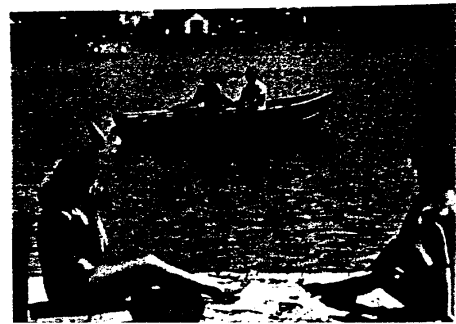
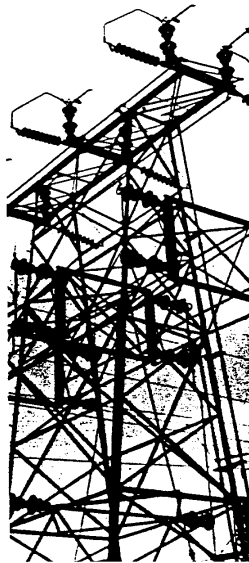
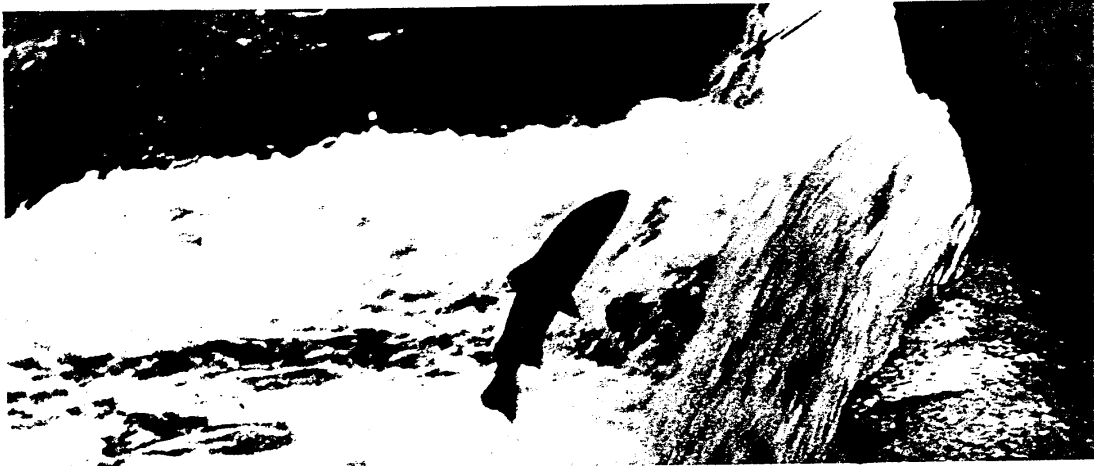
A key feature of the State Water Project is Oroville Dam, the highest earthfill dam in the world. Located a few miles above Oroville on the Feather River, this great dam will control floods, will produce power at both Oroville and Thermalito Power Plants, and will provide water to meet the needs of Californians.

Among these needs are water for fisheries, for crops, and for recreation.

One of the complex problems of big reservoirs, such as that which will rise behind Oroville Dam, is the control of the temperature of their released water. Locally, releases of very cold water can harm the fishery, can retard the growth of irrigated crops, and can discourage water sports.

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Cold water releases can harm the fishery, retard irrigated crops, and discourage water sports. Flood control and power production remain unaffected by water temperature.



FISH,

RICE, AND

SNORKLE

The California Department of Water Resources has studied the potentially detrimental effects of cold water releases from the depths of Oroville reservoir upon local crops, fisheries, and recreation.

Concluding that a means must be found to control the temperature of releases from Oroville reservoir so as to meet the diverse needs of a cold-water and a warmwater fishery, of rice growers, and of swimmers, snorklers, and water skiers, the Department set about to find that means.

This booklet describes the problems involved and reports on the solution discovered.



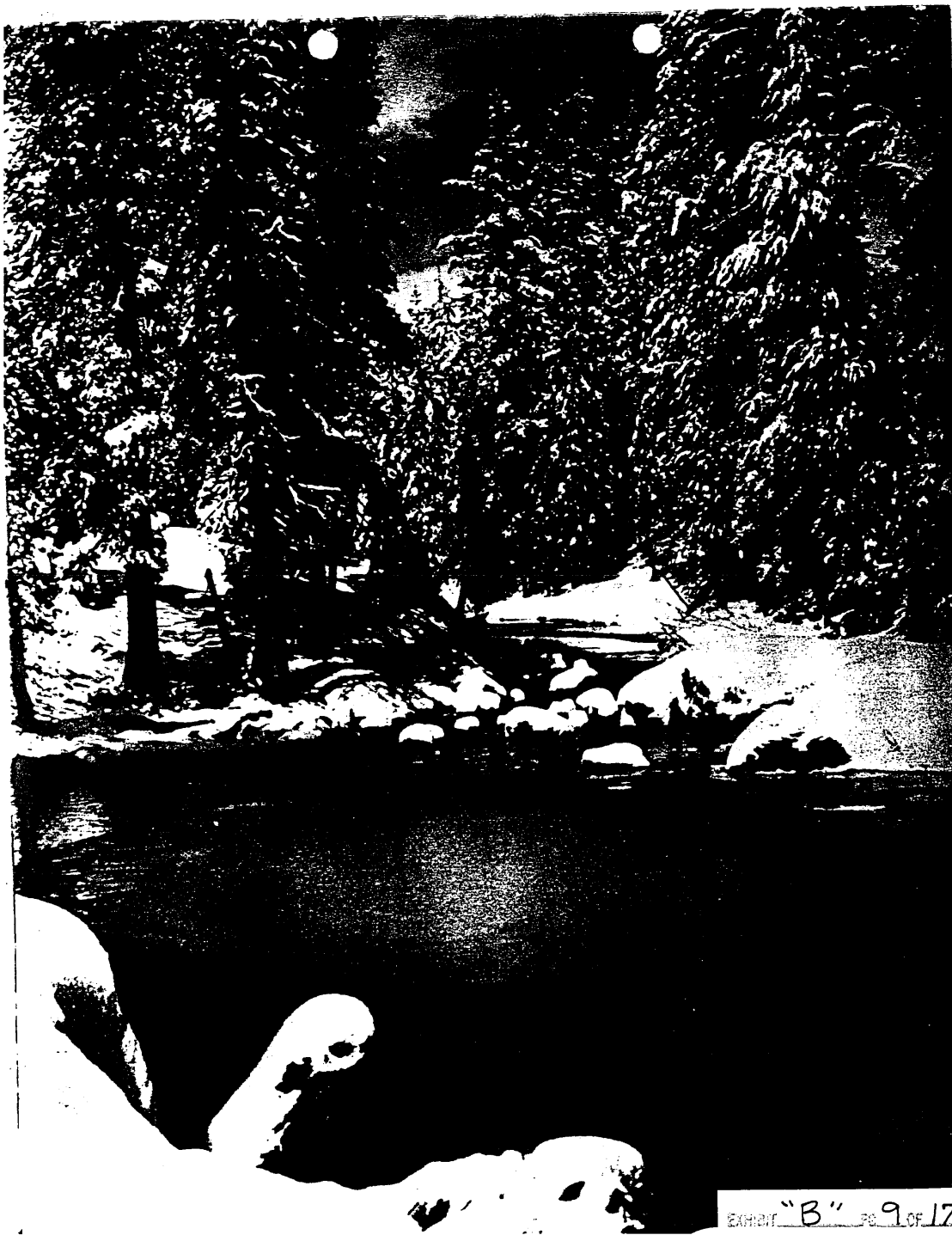


EXHIBIT "B" PG 9 OF 17

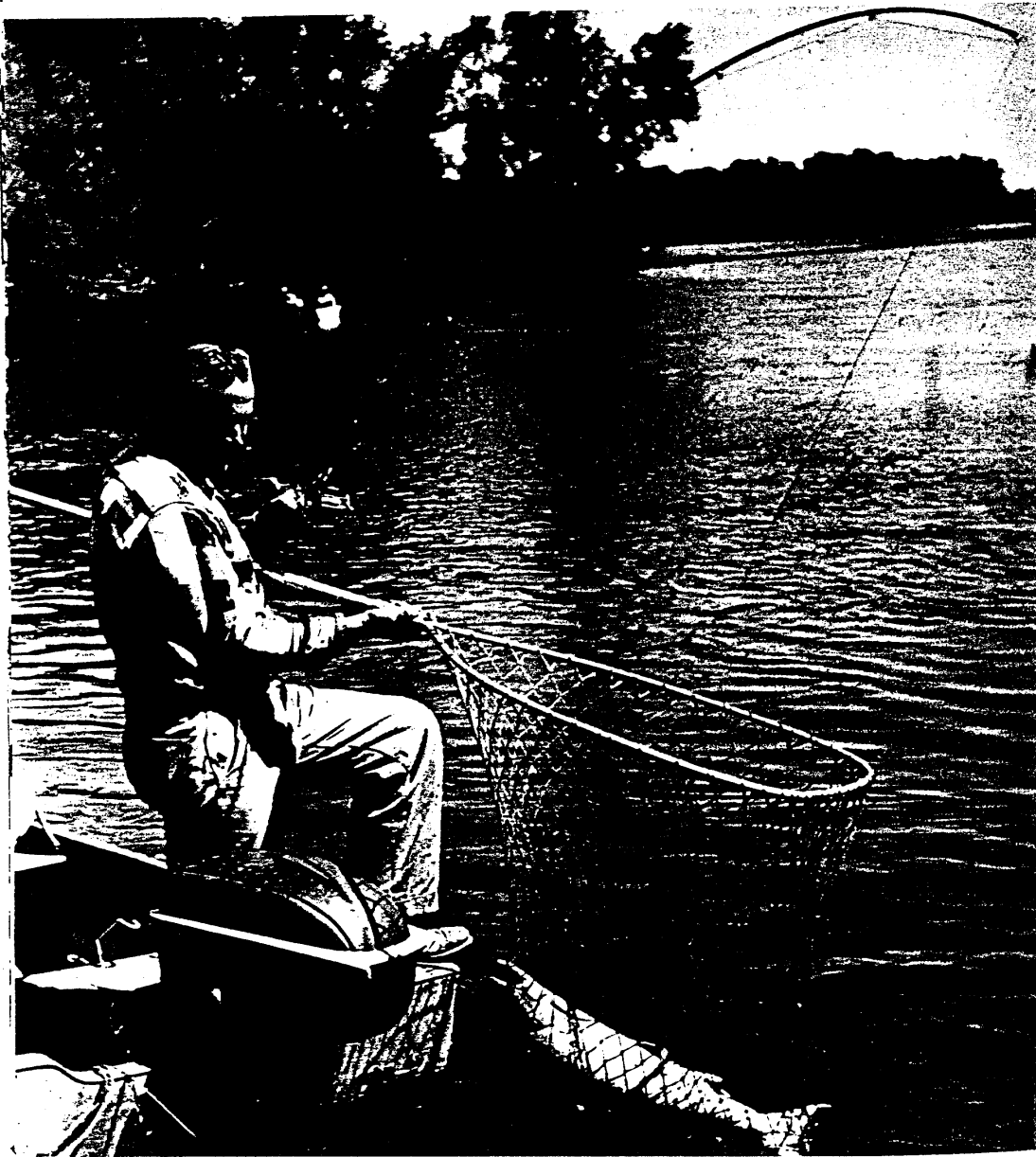
## COLD WATER

The reservoir behind Oroville Dam will have a maximum water surface area of 15,500 acres and a maximum depth of 700 feet. Stored at such depths, the water of melting snows and winter floods stays cold indefinitely. If the outlet structure releases water only from these depths, the temperature of the released water in May would be about 42°F.

In the past, rivers and streams near Oroville have been considerably warmer. They have averaged from 52°F on May 1 to 72°F in August. The existing fishery has flourished in these warmer waters. The Department of Water Resources intends to see that cold water releases from Oroville reservoir do not harm that fishery.

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Spring run salmon fishing



## FISH

The Feather River abounds in warmwater gamefish: striped bass, largemouth and smallmouth bass, shad, and catfish. During their growing season -- April through October -- these fish thrive best in waters averaging 60° to 75°F.

Equally important to the river are its spring and fall runs of king salmon. Both runs spawn in the cooler waters of fall, but the spring run salmon, which travel upstream in the spring and early summer, have sought the deep, cool, canyon pools above Oroville dam site. Water that is too warm harms the yet unspawned salmon eggs. In waters of an estimated 60° to 65°F, the spring run salmon rest until their spawning time in late September and in October.

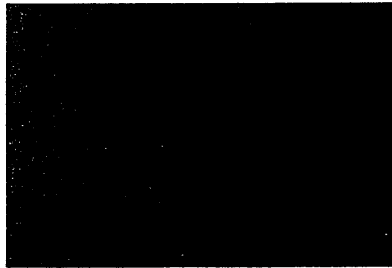
Blocked from these cool pools by Oroville Dam, the salmon would have to hold over in what traditionally have been warmer downstream waters if special provision were not made for their protection. Such provision will be made.

Water released from a single low-level outlet at Oroville Dam would be too cold for hatching salmon eggs and rearing young fish.

The Feather River Fish Hatchery, itself a part of the State Water Project, will lie below the dam.

Apart from a slight but desirable seasonal variation, water temperatures at the hatchery should hold around 55°F.

Unless the temperature of water released from Oroville reservoir is controlled, the Feather River Fish Hatchery cannot operate successfully.



## RICE

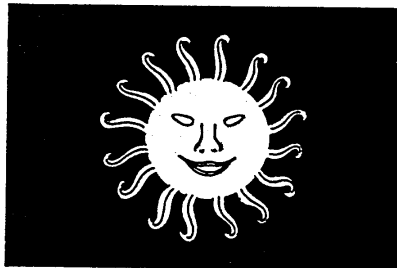
The fields of the Feather River Service Area will be irrigated by releases from Oroville reservoir. Rice production is important to the economy here; and irrigation water temperature is a critical factor in rice growth.

Cold water released from the depths of Oroville reservoir would harm the rice crop. Even without Oroville Dam, water temperatures of the Feather River are not ideal for rice growth. Their average May through August range has been from 52° to 72° F.

The University of California has demonstrated that rice plants thrive best when the temperature of irrigating waters ranges from 59° to 77° F. Even within this critical range, temperature fluctuation drastically affects the harvest.

Thermographs, placed in the Feather River above and below Oroville and in the canals of the Feather River Service Area, have provided a comprehensive record of water temperatures.

With a proper outlet structure at Oroville Dam, the temperature of releases can be controlled so as to serve the agricultural interests of the area.



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Rice fields

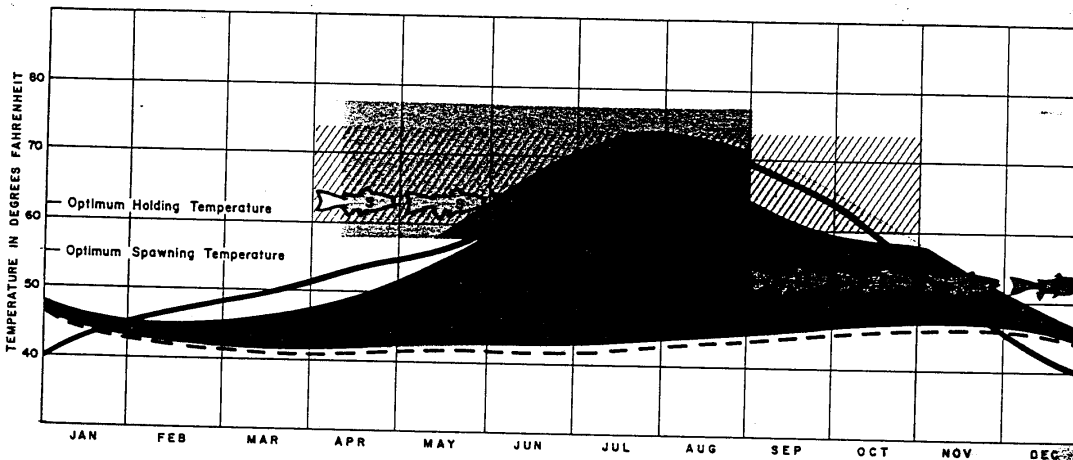




# TEMPERATURE RANGE CHART

## TEMPERATURES

-  FEATHER RIVER (WITHOUT OROVILLE DAM) 10 MILES BELOW DAMSITE
-  BOTTOM OF OROVILLE RESERVOIR
-  THERMALITO AFTERBAY WARMING EFFECT
-  RANGE AVAILABLE FROM OROVILLE RESERVOIR



## SALMON

S SPRING RUN

F FALL RUN



HOLDING PERIOD



SPAWNING PERIOD

## OPTIMUM WATER TEMPERATURE RANGES



WARMWATER GAME FISH GROWING SEASON



RICE IRRIGATION SEASON

This graph depicts historic average temperatures of Feather River waters and the estimated temperature range of releases from Oroville Reservoir and Thermalito Afterbay. It relates such temperatures to optimum temperature ranges for rice irrigation waters and for the warmwater fishery and to preferred water temperatures for the holding and spawning of salmon.

11-11-11